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GREEN DEAL INITIATIVES, SUSTAINABLE MANAGEMENT, MARKET DEMANDS, AND NEW PRODUCTION PERSPECTIVES IN THE FORESTRY-BASED SECTOR

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Title of the paper: Future Development of Wood Supplies Potential for the Slovak **Forest-Based Industry – Insights from Spruce Growing Stock Forecasts** *Name of the author(s):* Michal Dzian, Martin Moravčík, Hubert Paluš, Ján Parobek **Affiliation:** Department of Marketing, Trade and World Forestry, Technical University in Zvolen, Faculty of Wood Sciences and Technology and National Forest Centre, Forest Research Institute Zvolen

AGENDA

- Introduction
- Material and Methods
- Results



INTORDUCTION

Why is spruce so important?

- Representing a quarter of Europe's growing stock.
- It is one of the most present tree species in Slovakia.
- Spruce forest stands produce a significant volume of high quality logs that belong to the most important forestry products.



Slovakia is a country rich in forest resources.

- Forest area has increased steadily.
- Natural forests covered 2.37 million hectares, about 42% of the country's land area.
- Norway spruce grows in mixed forests and in monocultures.
- In 2022, European beech (34.8%), spruce (21.5%), and oak (10.4%) were the most abundant species.



- The proportion of Norway spruce is expected to decrease to less than half of its present share.
- In the recent years, drought, windthrow and bark beetle outbreaks have led to an unprecedented increase in spruce mortality



Image credit: Environmental Energetics

- Spruce forest stands produce a significant volume of high quality logs, accounting for 61.3% of the softwood supplies and 31% of the total wood supplies
- more than 84% of the total resources are used for industrial purposes and almost 16% are used for the production of energy
- The forest-based industry plays a pivotal role in Slovakia's economy
- The industry faces challenges due to climate change and the need for sustainable and nature-close forest management practices



Aim of the study

- The aim of this paper is to evaluate the sustainable management and the long-term viability of Norway spruce in Slovakia.
- It is essential to understand the future growth and harvesting potential of this species, and the need for sustainable forest management practices.

MATERIAL AND METHODS

- Sources of data: Summary Information on the State of Forest; Forest management records
- Methodological approch: the timber allowable cut is proportional to the growing stock in forests and cutting percentages
- Considering the felling volume and the level of accidental felling in spruce stands, two basic scenarios based on the following two assumptions were determined.

Scenario A

 we assumed that the current extent of spruce stand damages by the action of harmful agents will continue at the same trend as in the previous decade as a result of the impacts of climate change and the limitations of standard forest management.

$$DFP_{ia} = \frac{TYF_{ia}}{GS_{sw}} * 100$$

where:

- i index indicating the age class
- DFP_{ia} decennial felling percentage according to the actual volume of spruce felling
- TYF_{ia} actual volume of ten-years spruce felling until 2020
- GS_{sw} growing stock of spruce in m³



 we assumed that the felling of spruce will be equal to the volume of planned felling and corresponding felling percentages

$$DFP_{ip} = \frac{TYF_{ip}}{GS_{sw}} * 100$$

where:

- DFP_{ip} decennial felling percentage according to the planned volume of spruce felling
- TYF_{ip} planned volume of ten-years spruce felling until 2020

RESULTS



Figure 1 Development of spruce area



Figure 2 Development of spruce growing stock



Figure 3 Comparison of forecasted spruce growing stock in 2030 and 2040 under scenario A (GS 2030 A and GS 2040 A) and B (GS 2030 B and GS 2040 B).



Figure 4 Comparison of forecasted spruce felling (F) in 2030, 2040 and 2050 under scenario A and B.

CONCLUSION

- The Norway spruce, has exercised a decrease in cover by 13.2% and the reduction in growing stock by 16.4% since 2010
- The urgent need for sustainable management strategies to ensure the long-term viability of the Norway spruce
- The industry and the country's economy face major challenges from the projected decline in spruce stocks and the expected reduction in wood supply

Thank you for your attention!